

Summaries of Lecture Recordings Used As Learning Material in Blended Learning

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Abstract-In order to enhance learning, it is necessary to develop flexible learning methods in conjunction with traditional classroom teaching. Information and communications technology has developed enormously during the past years and but its potential as a teaching aid has not yet, however, been fully exploited in education. This paper describes the opinions of Finnish nursing students' on the usefulness of lecture recordings in nursing education at Tampere University of Applied Sciences. Faculty from the nursing education degree program of Tampere University of Applied Sciences produced thirty-one 10-62 minute lecture summaries or course content syntheses in five subjects. They were produced by four teachers and listened by 4 student groups in 2010-2011. In the study, 93 students completed a questionnaire, with a response rate of 52%. According to the results of the questionnaire, slightly more than half of the students listened to the recordings via computer and slightly less than half listened as podcasts on mobile device. Students stated that the recordings helped them to understand the key content of lectures and that they were of additional value to learning process when compared to the traditional PowerPoint teaching slides used in contact lectures. Opinions varied, however, as to whether students learned as much by listening to the recordings as they did by attending contact lectures. The lecture recordings enabled better time management, but the recordings did not, however, significantly affect the time used for preparing for examinations or for participating in contact lectures. The students found listening to the recordings an interesting experience and most of them would also like to listen to them also in the future. In a conclusion, the results of this project show that offline recorded lecture summaries are a good support for education either as additional course material or as a partial substitute for contact teaching. The lecture recordings support students' learning and are an agreeable learning method for students.

Keywords-*m-learning; podcast; lecture recording; lecture summary.*

I. INTRODUCTION

In this paper, we describe the results of our pilot project which started with the support of EU-funding and where we tested the possibility of using summarized lecture recordings in order to enhance blended learning.

The purpose of the empirical study was to find out how nursing students used lecture recordings, as well as their

experiences of mobile learning (m-learning) and usefulness of recordings in education.

The recording of contact lectures in a summarized form and then providing students with the recordings may promote learning. The teacher can use the recordings with several groups and, thus, save resources for the supervision of learning. More and more students are working and studying, and therefore, it is necessary that accessibility to higher education is expanded. One way to achieve this is to offer students video and audio recordings to help them in time management.

In the following sections, we will describe how lecture recording technology is currently used and how the use of lecture recordings in education has been described in literature. We will then present a case study on student views and its findings. The conclusions section presents a short summary of the pilot project and the most significant findings compared with the findings of earlier literature.

II. EDUCATION TECHNOLOGY CURRENTLY USED

It is necessary to develop flexible learning methods together in conjunction with traditional classroom education. The possibilities offered by the information and communications technology that has been developed have not yet been fully exploited in education. Tampere University of Applied Sciences has piloted the use of lecture recordings as support for education. The aim was to develop a mobile and practicable model.

The cost of IT support will rise to a high level if free programs are used for lecture recording and IT staff is needed at diverse phases of the process. As part of the project we acquired the Echo360 system [1]. A disadvantage of the system was its relatively high price but an advantage was the easy process. The Echo360 system includes two lecture-recording tools. One is the classroom model, where the system records the contact lectures using either the AdHoc or timing method. The other is the Personal Capture program, in which case the teacher records the lecture independently on the computer with the client and headsets. The teacher does not need to worry about the technology in either model. The system transfers the recordings to a server

in three formats: as podcast, vodcast, and flash video. The system makes the links and, thus, IT support staff is not needed [1].

Podcasting means the distribution of audio and video files at the digital format via Internet. By means of podcasting feeds, sound and video recordings can be ordered to a media player program such as iTunes. It is possible to synchronise podcasts from the computer to a mobile device such as an MP3 player or mobile phone. The term podcasting emerged from the use of Apple's portable audio player the *iPod* [2].

Currently, Tampere University of Applied Sciences provides podcast feeds and video links only for own students in the course management system. The student can select the link or feed according to the terminal used. The student can watch lectures on the computer or transfer podcasts to a mobile device as video or sound recordings (vodcast and podcast).

III. LECTURE RECORDINGS IN BLENDED LEARNING

Lecture recordings can have different roles in education. The most common use is to provide recordings of complete lectures for the purpose of review and revision (substitution use) when they can be used to enhance student understanding of the course content. The second most common use is to provide additional learning material, summaries of lectures or syntheses of course content, to broaden and deepen student understanding (supplementary use) [2].

Lectures can be created in many different ways. Poor lectures can leave students bored and frustrated, but good lectures can inspire [3]. Isaacs [4] observed that lecturing is often characterised by the transfer of the lecturer's notes to the students' notepads without any thinking about or processing of the information. Anyway, the lecture should be more than just the transfer of information. The lecture should inspire and enthuse students, assist them in understanding the complex material and guide them through the topic [5]. Effective lectures can provide the excitement of intellectual discovery through the presentation of challenging and provocative ideas. The lecturer can relate the lecture content to the students' prior knowledge and relate it to real life examples thus, making the knowledge more meaningful [6].

Recordings can trigger memories of the lecture that aid understanding better than just looking at the notes. Listening provides variety for traditional reading. Knowing that there is a possibility to "go back" at any time was a great idea according to students even if the students did not use the files as much they had planned [7].

Student access to audio recordings during assessment times might also help to reduce failure rates. The recordings could help students to understand at topic when it is difficult to take in new concepts and methods the first time they are presented or if students miss the lecture for one reason or

another. They can also free the student from having to make notes during the lecture [7].

The mobile device offers the possibility to study based on individual needs and to download the materials needed in the student's own learning process. The benefit of mobile devices is that they can be used in on-the-go situations, such as driving a car, travelling by bus or train, walking, and exercising. Studying can be practised outside the classroom along with other activities [8]. When the student can concentrate on learning at a suitable time, it may increase the motivation to study.

Learning demands a lot of work and concentration from the student. Because of this, learning in on-the-go situations also includes dangers. The learner may pay attention to other things rather than learning at times and the learning process can become susceptible to diverse distractions [9]. However, the student's thoughts may also become distracted in the classroom.

Even if lecture recordings make it possible to study in different places, the student can also choose the traditional way of learning. According to Lee and Chan's study [10], students treated podcast listening as a formal learning activity that needed undivided attention and concentration within a designed study location, e.g. at home and not as m-learning while doing other tasks.

In most cases, lecture recordings include multimedia content such as audio, video, and visual aids [7]. In Brittain et al.'s [11] study 66% of students (N=70) preferred the audio-only format instead of the video file or audio synchronized with PowerPoint slide images when all the recordings were exported and available in those three formats. Of those students who used media files, 75% listened to them at home. In spite of this, the results clearly indicated that students preferred the mobility of audio recordings rather than video. Most of the students tended to download the files close to the relevant examination date (44.4 %), one fourth as soon as they were available, and the rest of the students infrequently [11].

Huntsberger and Stavitsky [12] found that 40% of students used podcasts as a replacement for textbooks. This replacement of textbooks with podcasts challenges teachers to create recorded material that does not provide too much detail in order not to make books or other core texts seem unnecessary.

On the whole, it is challenging to make meaningful lecture recordings. Attention has to be paid to the education content because lecture recordings must not be too extensive and the content must be short and independently related to the wider entity to be learned [8]. The appropriate length of lecture recordings is 20-30 minutes. According to feedback given by students, it would be better to record content some other time than during the lectures or they would need editing because it is confusing when there is a discussion in class on some topic that lasts for several minutes [7]. Do summarized lecture recordings better meet the needs of the students?

IV. THE EFFECTS OF LECTURE RECORDINGS ON LEARNING RESULTS

Does the availability of lecture recordings have an impact on lecture attendance? It is a question that needs long-term research before it can be answered. According to the findings of von Konsky et al. [13], students showed a tendency to listen to the recording of a missed lecture but the students who achieved a high grade tended to supplement lecture attendance with recordings more than students who achieved a low grade. According to Balfour's [7] study, there was no consistent relationship between audio file use and the end-of-module examination. However, students liked audio recordings and gave them a valuable role in the learning process. The use of lecture recordings supports the learning of some students, but there is also a large variation in other successful learning patterns [13].

Foley [14] used lecture recordings before the contact lessons in advanced computer science courses. He found that the group of students who listened to the lectures via a laptop or mobile device before attending the lecture performed about 10 percent better on the test than the group that only had the traditional classroom lecture. The lecture content, homework, and examinations were the same for both groups. Foley thought that there was more time for meaningful discussion in the classroom once the lecture was out of the way [14].

In Brittain et al.'s [11] study 85% of the dentistry students who used lecture recordings thought that the recordings had a positive effect on their grade. In total, 91% of the students used lecture recordings to review the lectures they had already attended.

According to a student survey (N=687) in the USA, the most popular responses to the question: "How did the recorded lectures benefit you?" were that they helped students to review the classroom material, helped students to prepare for examinations, clarified confusing topics, and allowed the students to learn independently. Other responses were that they improved the overall learning experience, helped to use time more efficiently, and were an alternative to attending class. Of the respondents, 81% watched the recordings once a week and they agreed that watching the recorded lecture increased their understanding of the topic. A total of 88% of the respondents said that they would like to have more lecture recordings in their courses [15].

V. CASE STUDY

Finnish nursing teachers at Tampere University of Applied Sciences have used the Echo 360 system since the fall of 2010. During the first year, four lecturers recorded their lectures with Echo360 Personal Capture software. The topics of the lectures were anatomy and physiology, the

basics of cardiology and vascular nursing, social policy, nursing administration, and thesis methodology. The number of the recordings was a total of 31. The length of the recordings varied from 10 minutes to 62 minutes. Most of the lectures included Power Point slides and the lecturer's voice explaining the topic. The teachers planned their lectures to form short entities and recorded them without an audience in the classroom.

The lecture recordings were integrated with formal learning courses for full-time students. The students had some contact lectures in each course and some of the topics were taught totally using virtual methods with the lecture recordings. Students had time for listening in their schedule and the links to the recordings were available in the e-learning platform Moodle. The students had the possibility to listen to the recordings on a computer or on a mobile device as podcasts. They were given guidelines for downloading the links to iTunes and the mobile device.

After the examination all the students were sent a link to the survey questionnaire by email. They were told that the aim of the survey was to evaluate a new way of learning by using ICT technology. The students were told that answering the survey was voluntary and they were able to answer anonymously. The survey consisted of 14 structural quizzes and three open ended questions.

The quantitative data of the structural quizzes were analysed using frequency distributions, and the results were described using percentage distributions.

VI. FINDINGS

A. Information on the respondents

The recordings were available for four nursing student groups. In all, 179 students listened to the recordings. The survey questionnaire was answered by 93 students, and the response rate was 52%. Most of the students (86%) were first-year nursing students and the rest were third-year students. Most of them were under 25-year-old females.

B. Students' recording listening habits

Most of the students listened to the recordings only by computer (55%) and 42 % of them used podcasts. A total of 3% of the students did not listen to the recordings at all. The majority of the students felt that it was easy to download the lectures to podcasts with the instructions given, but for a fifth of them downloading sounded so complex that they did not even try. Some 17% of the students could download the recordings without prior instruction.

Of the respondents, 42% listened to the recordings at home, a third while jogging or walking, and 13% while driving. The recordings were also listened to while doing housework, during free periods at school, in the gym, and while sunbathing. While listening to the recordings, 8% of

the students made notes, 70% followed the slides during listening, and 19% just listened to the podcasts.

Of the respondents, 53% listened to the recordings during the examination week and 37% as soon as they were published. Some 62% said that they liked that they could listen to the lecture recordings when they wanted. A further 14% experienced difficulties in independently finding time to listen to the lectures, and 9% said that they had wanted the listening to be more scheduled.

C. Student opinions on the usefulness of lecture recordings

Of the students, 69% agreed fully that the recorded lecture brought additional value compared to viewing only PowerPoint slides. A total of 84% of the respondents agreed fully or partly that the lecture recordings helped them to better understand the key contents compared with reading a book. Student opinions varied on whether they learned as much by listening to the lecture recordings as they did by attending the contact lectures (Figure 1).

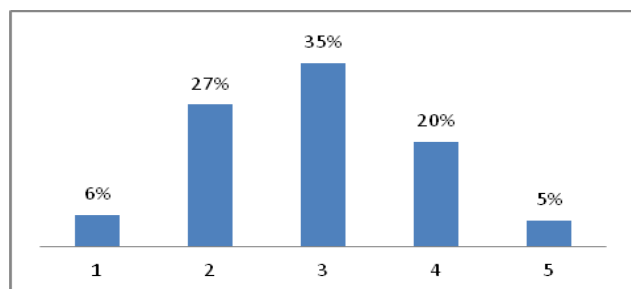


Figure 1. "I learn as much by listening to lecture recordings as by attending contact teaching lessons." "1. Fully disagree – 5. Fully agree".

Two-thirds of the respondents stated that they had used the recordings to review difficult matters. A third of the students said that they had read the textbooks less when the lecture recordings were available. The respondents felt that the use of the lecture recordings had not affected the time used for preparing for the examinations. A fifth of the respondents said that they attended fewer lectures when the lecture recordings were available. Half of the respondents thought that the use of the lecture recordings enabled working and studying at the same time, and two thirds stated that the recordings enabled a combination of studying and family life. A third of the respondents considered that the use of the lecture recordings enabled the completion of several courses at the same time (Figure 2).

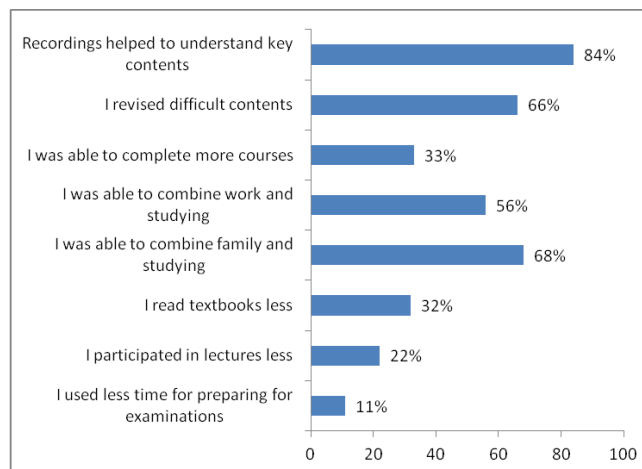


Figure 2. Students' perspectives on the usefulness of summaries of lecture recordings.

The majority of the students considered the lecture recordings as interesting, of suitable length, and a nice variety for the studying (Table 1). Of the respondents, 73% wanted to listen to lecture recordings also in future and the rest would possibly like to listen to them. No one answered that they would not want to have lecture recordings anymore.

TABLE 1. STUDENTS' OPINION OF LECTURE RECORDINGS

Opinion	%
Interesting	55
Suitable length	76
Nice variety for the studying	80

VII. CONCLUSION

This paper studied the use of teachers' lecture summaries as education material, not the recording of authentic classroom lectures. The lecture summaries partly compensated for contact teaching lessons and partly were support material for education. When students listen to a lecture as homework it provides a possibility to create a lecture in a new more active way that was piloted by at least one lecturer with good feedback. When offline recorded lectures are combined with other homework, it is possible to create a distance learning method. However, it is important to consider the total amount of the students work and be realistic how much the students are able to study independently. Lecture recordings are an effective teaching and learning method from the lecturer's point of view. The learning material can be easily shared with several groups once it has been produced.

The students stated that the lecture summaries were of an appropriate length (10-62 min) and interesting. According to the results, the recordings helped students to understand the

key contents and that the students used them for revising the difficult contents. These results were also found in Balfour's study (2006) [7]. The majority of the students listened to the recordings during the examination week, as the students did in the study of Brittain et al. (2006) [11]. Earlier studies have studied the connection between listening to lecture recordings, the learning results, and the course grades (Brittain 2006 [11], von Konsky 2009) [13], but this connection was not studied in this paper, as it is affected by many concurrent factors, such as the teacher, time, other studies, and the development of educational contents.

Half of the students listened to the lecture recordings on the computer and at home concentrating on studying only, and not as m-learning on-the-go situations even if it was possible, as shown by Lee & Chan's results (2007) [10]. Further study is required to see if m-learners felt studying was different than those who listened via computer.

Mobile learning is new for students and it takes time to learn new studying methods. This problem probably concerns attitudes more than skills because students felt that the used technologies were easy to use even for those who had not experience of podcasts beforehand. Students also have different learning styles, as was shown by the varied opinions on whether they learned as well by listening to the lecture recordings as they did by attending the contact teaching lessons.

Many students work and have a family and, thus, it is important to develop new blended learning methods. Lecture summary recordings as learning materials are one way to develop the education contents. Students have experienced them as being meaningful and useful and they support at least some of the students' learning.

In our case some lecture recordings were used to replace the contact lessons. This method can save the time of the lectures and the students when they do not need to travel to the campus. In Finland we have quite long distances to some campuses of the University of Applied Sciences. It is need to create some activities how to motivate students to concentrate studying, as according to findings some of the student said they had wanted the listening to be more scheduled.

A further challenge is to study what makes a good podcast, what elements do students like and what helps them learn? Another challenge is to study teachers' experiences of constructing lecture recording summaries and using them in education. The copyrights of the lecturers are a challenge question to solve in Finland. We do not have yet a culture as some universities for example in America have, where professors are willing to share their lecturers in Open University. On the other hand, if recordings are produced in Finnish language they are relevant only for the students in Finland. However, we believe in future we are more open-minded and able to share our material more.

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